



Air Force Research Laboratory



Integrity ★ Service ★ Excellence

Information Directorate Overview





AFRL/RI Mission & Vision



Mission:

To explore, prototype, and demonstrate high-impact, game changing technologies that enable the Air Force and Nation to maintain its superior technical advantage.



Vision:

To LEAD the Air Force and Nation in Command, Control, Communications, Computers, and Intelligence (C⁴I) and Cyber science, technology, research and development.



Information Directorate Mission

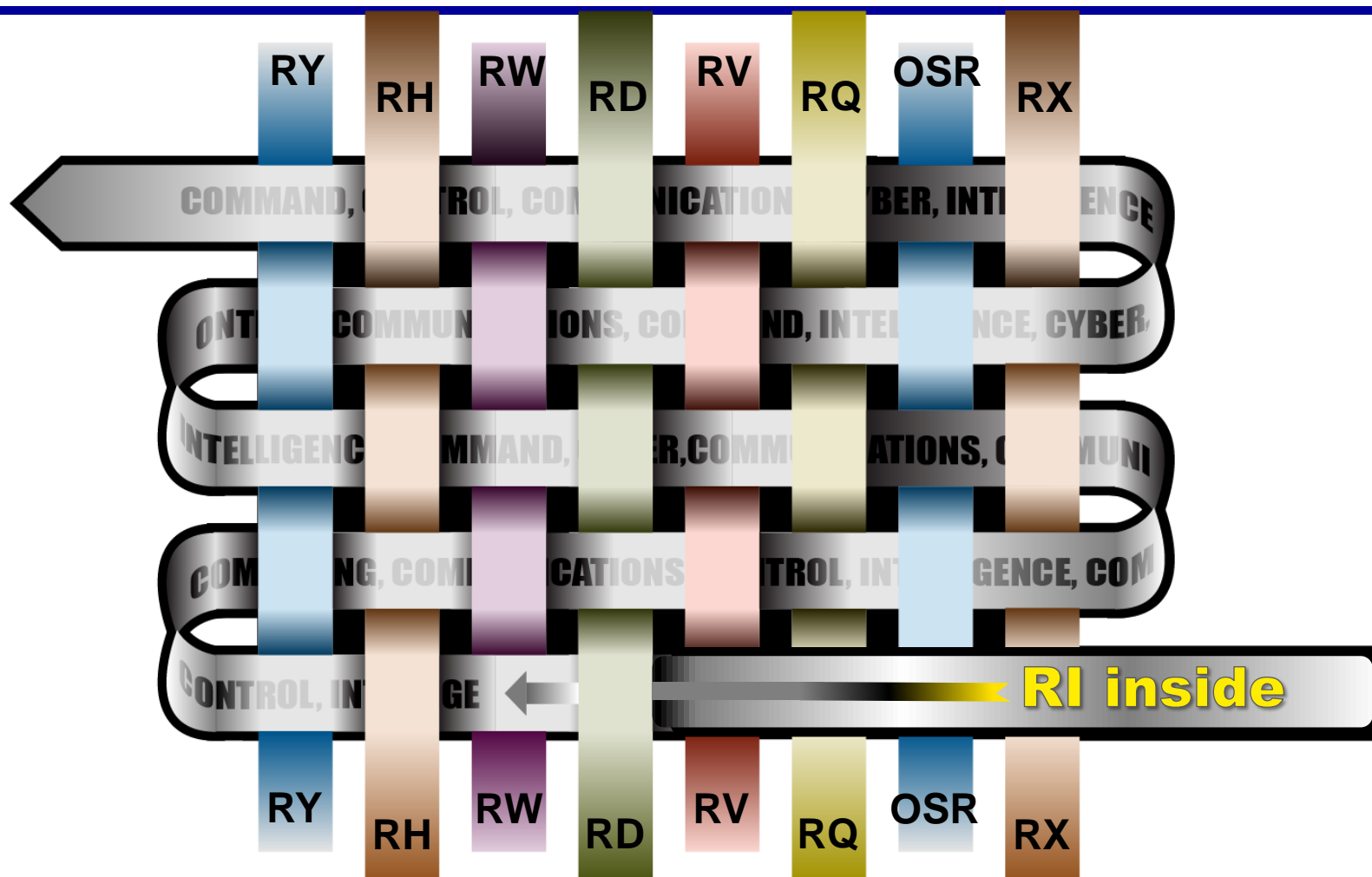


Rome = C⁴⁺¹I



Information Technologies

.....Touch **Every** Other AFRL Directorate



Information Technologies touch **EVERY** Air Force, DoD, & National Mission



Core Technical Competencies



PUTTING THE RIGHT INFORMATION
INTO THE RIGHT HANDS AT THE
RIGHT TIME

Leveraging And Shaping
The Cyber Domain To The
Nation's Advantage

Communications

Cyber

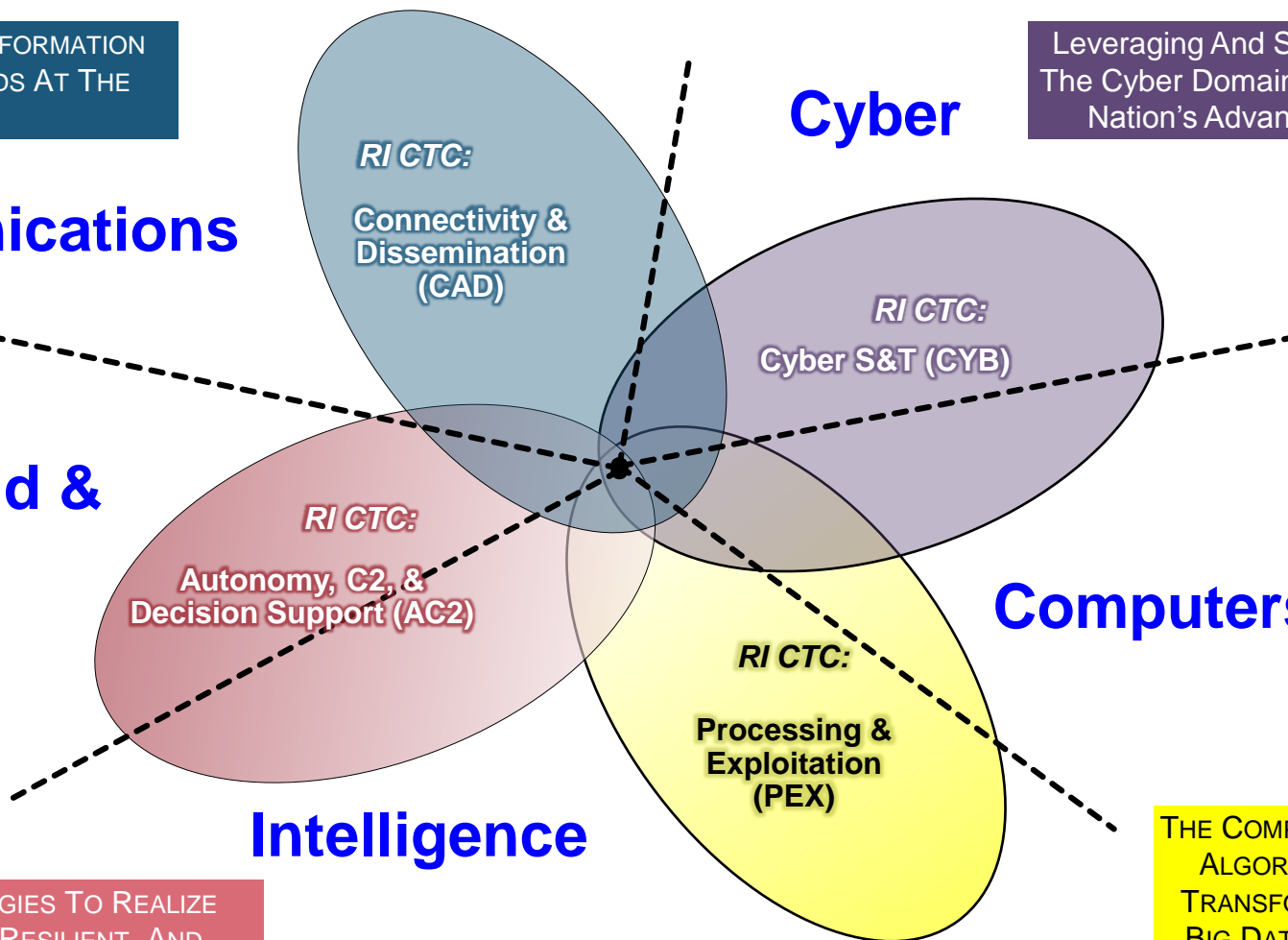
**Command &
Control**

Computers

Intelligence

INVENTING TECHNOLOGIES TO REALIZE
TRULY INTEGRATED, RESILIENT, AND
ROBUST COMMAND AND CONTROL SYSTEMS

THE COMPUTING &
ALGORITHMS
TRANSFORMING
BIG DATA INTO
INFORMATION





Autonomy, Command & Control (C2) and Decision Support

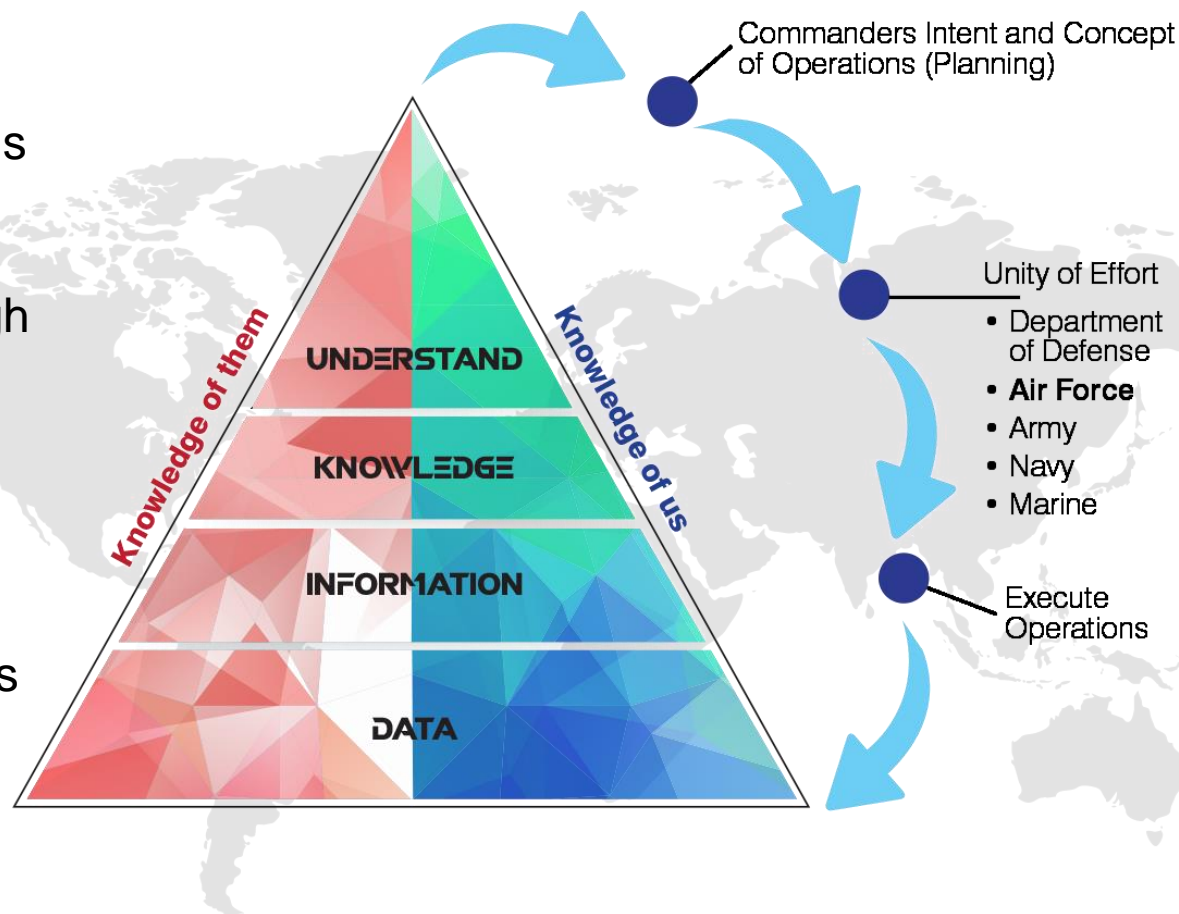


Vision

Trusted, highly autonomous C2 systems for synchronized, multi-domain effects in complex, contested, high tempo conflicts.

Mission

Deliver innovative, trusted, affordable information technologies for agile, resilient, and distributed Air Force command and control systems.



**INVENTING TECHNOLOGIES TO REALIZE TRULY INTEGRATED,
RESILIENT, AND ROBUST COMMAND AND CONTROL SYSTEMS**



Processing and Exploitation



Vision

Employing massive data analytics for game changing solutions to revolutionize Command, Control, Communications, Computers, and Intelligence (C4I) and Cyber for the Air Force and Nation.

Mission

Lead the discovery, development, and transition of all-source processing and exploitation innovations for the Air Force and Joint communities.

Challenges

- Manage, process, and exploit current massive amounts of intelligence, surveillance, and reconnaissance (ISR) data flows to analyze patterns of life
- Infer relationships and assessment of the current situation
- Exploitation in denied areas
- Process actionable ISR information via high performance massively-parallel systems
- Energy efficient computing for size, weight, and power constrained at-the-sensor processing

THE COMPUTING AND ALGORITHMS BEHIND TRANSFORMING BIG DATA INTO INFORMATION



Cyber Science and Technology

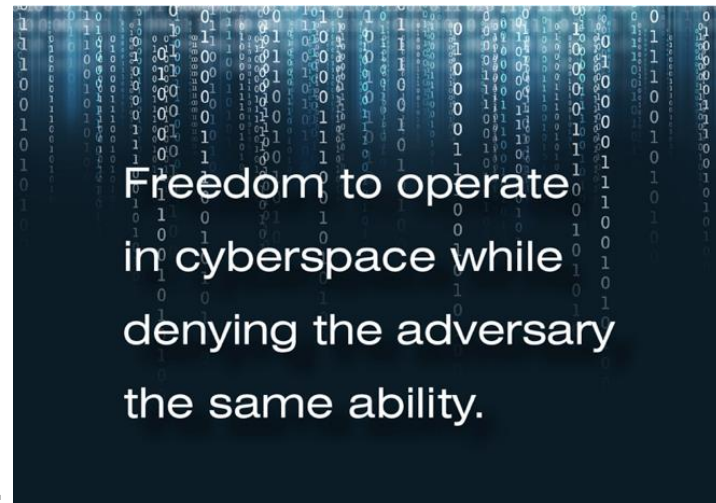


Vision

Create the future Air Force and Joint service assured operating environments that provide for mission aware and resilient full spectrum capabilities.

Mission

Design, develop and transition innovative cyber capabilities to the Air Force and Joint communities.



Challenges

- Full spectrum cyber operations for cyberspace superiority
- Mission awareness for assuring effective missions
- Cyber agility to disrupt/deny adversary attack planning
- Cyber resiliency to fight through and recover from attack
- Hardware & software “Root of Trust” for computational platform assurance

LEVERAGING AND SHAPING THE CYBER DOMAIN TO THE NATION'S ADVANTAGE



Connectivity and Dissemination



Vision

Seamless networked communications fabric across the C2ISR enterprise – Assuring delivery of timely, reliable, and actionable information to warfighters and systems.

Mission

Provide agile and secure mission-responsive communications and information sharing globally.



Challenges

- Congested, contested and anti-access/area denial (A2AD) operational environments
- Affordable net-enabled C2ISR for tactical and expeditionary capabilities
- Cross-domain security multimedia information sharing
- Mission-aware, on-demand prioritization of information flow

PUTTING THE RIGHT INFORMATION INTO THE RIGHT HANDS AT THE RIGHT TIME



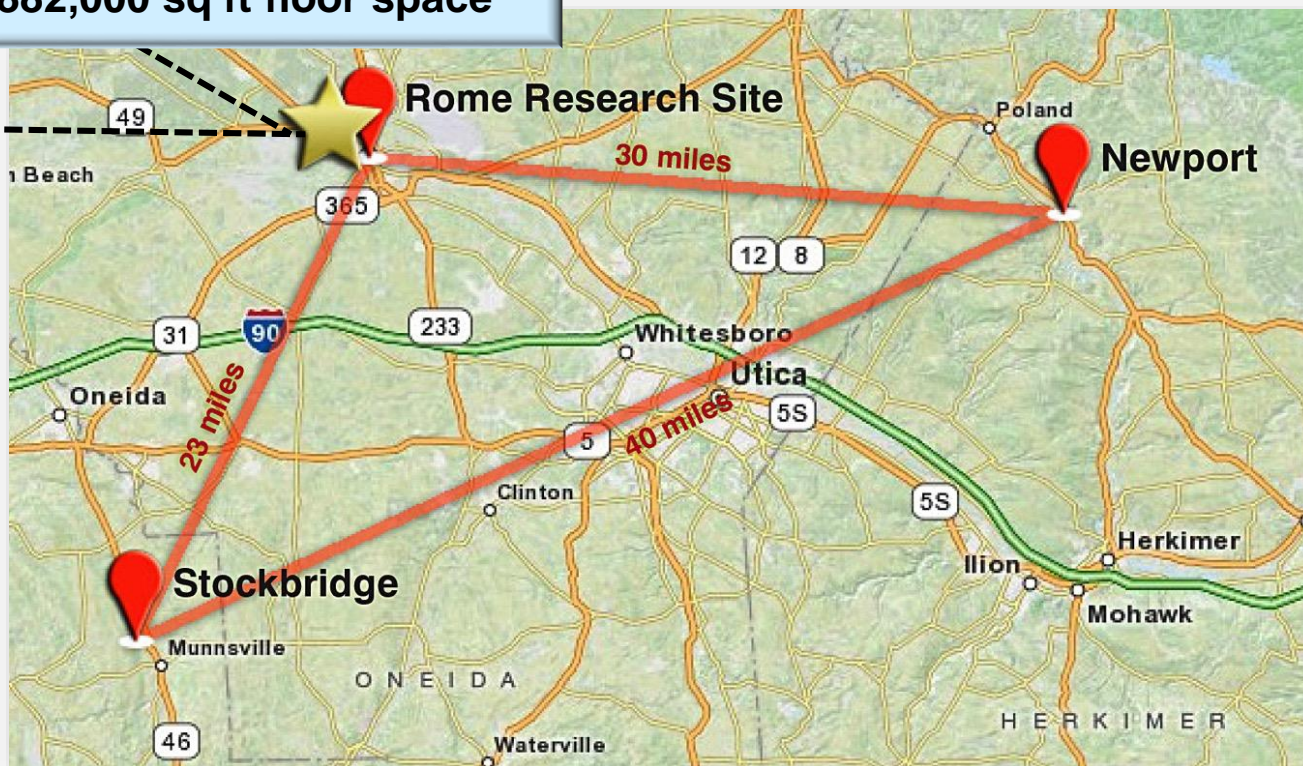
AFRL Information Directorate



**65 Acre Campus,
30 Laboratories & Facilities
882,000 sq ft floor space**

Government/Military
Scientists &
Engineers.....**444**
Government/Military
Professional Staff...**365**
Onsite
Contractors.....**440**
Visiting
Professors.....**61**
Students.....**99**

As of July 2016



**Total Gov't Staffing - 809
Total Directorate Staffing - 1,249**



Stockbridge Remote Research Site



- **Controllable Contested Environment**
- **Small Unmanned Air Vehicle Range**

- 300 Acre Site
- Uncontrolled Air Space
- Quiet Electromagnetic Environment
- Flexible Frequency Authorizations



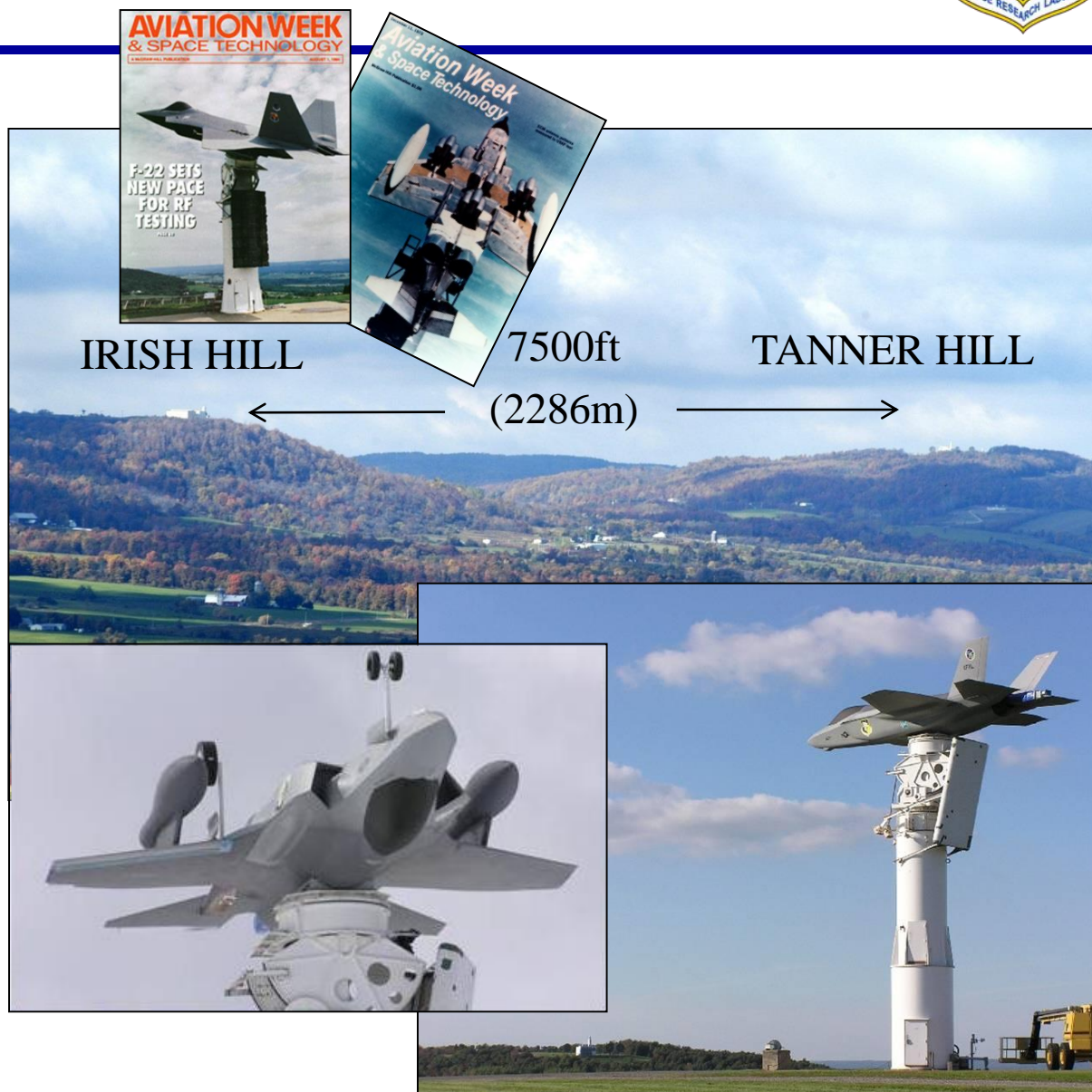


Newport Remote Research Site



Far Field, Elevated Outdoor Antenna Test Range

- 78 Acres
- 360 Degree Pattern Measurement
- Established in 1972
- Ideal Geography





Facilities



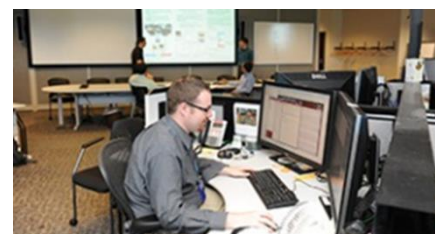
Machine Intelligence for
ISR Laboratory



Situation Awareness Laboratory



Command and Control
Concept Center (C2CC)



Operational IM Development
Laboratory



Secure Embedded High
Performance Computing



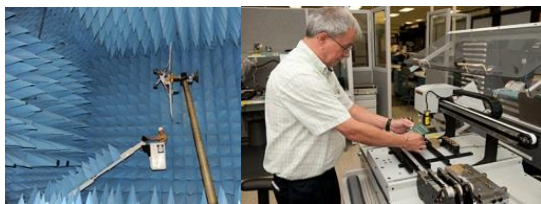
Command and Control
Technology Center (C2TC)



Quantum Information
Science Facility



High Performance Computing Facility



RF Technology Center



Network-Centric Integration &
Interoperability Facility



Cyber Operations
Technology Facility



Quantum Communications
Laboratory



Operational Information
Management Lab



Integrated Intelligence
Innovation Faculty (I3F)



Advanced Computing
Applications Laboratory



Audio Processing Lab



Nanotechnology and
Computational Intelligence
Laboratory



Cyber
Experimentation
Environment (CEE)

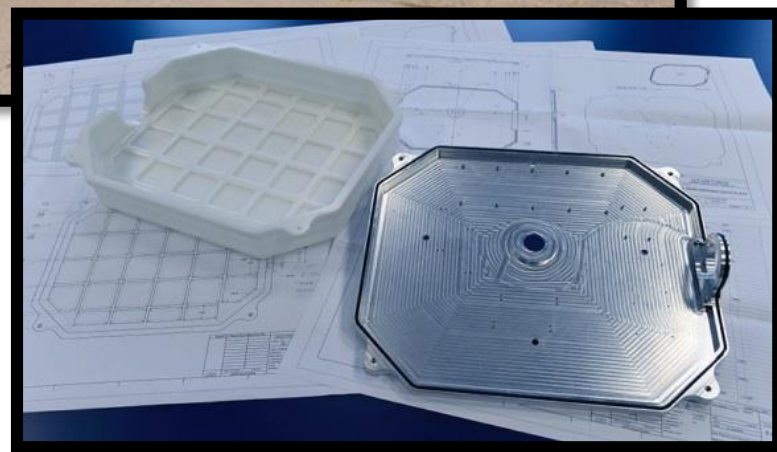


Corporate Collateral
Facility (CCF)



Fabrication Shop:

If you can dream it, they can build it!





Summary



C⁴⁺¹ Results for AF and the Nation